

## CONTACT STOMATITIS DUE TO A DENTURE IN A METAL SENSITIVE PATIENT

KARL J. DESSLER, M. D.

*Oakland*

AND

G. RUTLEDGE SHEETS, D. D. S.

*Oakland*

A CASE of contact stomatitis in a metal sensitive patient (nickel-cobalt), was found to be due to the nickel content of a denture made of a dental casting alloy, "Ticonium." Contact stomatitis, due to dentures consisting of synthetic material (hecolite), has been described by Rattner.<sup>1</sup> The following studies and observations appear to be of interest.

### REPORT OF CASE

The patient is a married, white woman, forty-three years old. Her general history is irrelevant. No allergic manifestations such as pollinosis, asthma or eczema had been observed among any of her relatives. She stated that, approximately three years ago, she had acquired an upper partial dental plate, but she had been unable to wear it because it caused the following disturbances in her mouth:

A few hours after it was put in place, the patient noticed slightly increased salivation; and after approximately twelve hours, a burning and itching sensation. If the denture was removed, after twelve to fourteen hours, these disturbances would disappear in a few hours, except for a slight redness in the area of contact of the denture and the mucosa.

If the denture was left in the mouth for approximately twenty-four hours, the mucosa became inflamed and finally ulcerated, leaving a denuded area approximately two millimeters in depth, with elevated edges. An inflammatory edema involved the whole mouth, particularly the soft palate. The itching and burning increased, until it became practically unbearable. If the denture was not replaced, the lesion disappeared gradually and completely.

The plate was recast to insure a better fit, as it was assumed that the lesions were due to pressure against an unusually sensitive mucosa. However, the patient was unable to tolerate the new denture.

### COMMENT

At this time, one of us (Dr. G. Rutledge Sheets), covered the denture with Eugenol paste and instructed the patient to wear the plate. The patient was able to wear the plate without symptoms for a period of time, in which symptoms had always developed on previous trial. A part of the Eugenol was removed, the metal exposed, and a lesion developed in the mouth exactly corresponding to the area of contact. Contact stomatitis due to the denture was assumed.

After the problem was discussed with the patient, she produced, at a subsequent visit, three items, namely, a ring, part of a wrist watch and a necklace. She stated that she had worn the ring for several months when she developed, on the area of contact of the ring and her fingers, an itching skin lesion which returned every time she again wore the ring for two or three days.

The alloy, of which the denture was made, proved to be Ticonium, the constituents of which are (according to the manufacturer), nickel, cobalt, chromium, molybdenum and beryllium.

### FURTHER TESTS

Nickel sensitivity was suspected, and the following patch tests were carried out: The denture itself, a strip of Ticonium, a strip of dental gold and a buffalo nickel were cleaned with acetic acid, and applied to the skin of the upper arm so that they remained in close contact.

After forty-eight hours, typically positive patch tests had developed under the denture, the strip of Ticonium and the buffalo nickel. The skin under the strip of dental gold showed no change. After twelve hours the itching had become very marked.

On two successive occasions these tests were repeated in combination with nickel sulfate solution, 5 per cent. On each successive trial the patch test reactions occurred and were comparatively more severe. The nickel solution elicited a typical positive patch test.

Contact with a small piece of nickel produced a characteristic lesion on the patient's palate after ten hours.

Passive transfer tests with the patient's serum, in which the sensitized areas were patch tested with nickel, gave negative results.

A nickel-free casting material was found in the commercial product, "Vitalium." A preliminary patch test gave, to our surprise, a positive reaction. According to the manufacturer, Vitalium consists of cobalt, 65 per cent; chromium, 30 per cent, and molybdenum, 5 per cent.

Patch tests with the following solutions gave these reactions: chromium potassium sulphate 10 per cent aqueous, negative; cobalt chloride 2 per cent aqueous, positive; molybdenum, not done.

### CONCLUSION

It was concluded: 1—that the patient was nickel- and cobalt-sensitive; 2—that her oral lesions represented a contact stomatitis.

The etiology and pathology of this contact stomatitis were thought to be the same as that of her skin lesions, which were of the nature of a contact dermatitis in a nickel-sensitive patient.

The alloy used for her denture was a widely used, commercially available alloy: Ticonium.

### DISCUSSION

The initial sensitization was thought to be due to the nickel-containing ring. It was worn at first without symptoms for at least two months. During that period a local and general sensitivity to nickel developed. Contact with nickel in the same ring, in a wrist watch and a necklace produced skin lesions, and the time of these occurrences (after ten hours of contact), suggests that at that time the sensitivity had been well established. ("Beschleunigte Reaktion.")

Extensive exposure to nickel during patch-testing further intensified and sped up the reaction of the patient.

Nickel-containing alloys are frequently used in dentistry as casting alloys for dentures. They remain in prolonged and intimate contact with

body tissues under conditions which favor their solution in liquid media and their absorption.

It is to be expected that patients already sensitized to nickel, or those who become sensitized while wearing their dentures, will develop a contact stomatitis. Among cases of nickel sensitivity nickel contact dermatitis is a comparatively frequent form of clinical nickel sensitivity. It is not infrequently seen in patients whose history gives no suggestion of heavy or prolonged exposure, and it is to be assumed that these patients become exceptionally readily sensitized due to some undetermined predisposing factor.

It is suggested that nickel sensitivity be suspected in patients who wear metal dentures, and who develop local or general stomatitis, if no other explanation can be found for their stomatitis.

A careful history and the simple procedure of patch-testing the patient with the material to be used in the denture will reveal an already existing nickel sensitivity, and save the patient and the dentist much inconvenience. However, a previously normal patient may become sensitized while wearing the dentures, and in such a case patch-testing may or may not be helpful, depending on whether or not the sensitization has become generalized.

The medico-legal aspect is to be remembered, as the patient might claim negligence on the part of the dentist. The dentist certainly would not want to be less careful regarding his methods than the operator in a beauty salon, in which a patch test is an established routine before an application of a skin-sensitizing hair dye.

Finally, attention is called to the possibility of metal sensitivity or metal sensitization, its potentially grave sequelae and the necessity for patch testing, in the use of alloys in orthopedic surgery, where such alloys remain in prolonged and close contact with human tissue when they are used in bone surgery, as plate screws, nails and lag screws. Attention should be paid to metal sensitivities in complications after the use of alloys in bone surgery, and it is suggested that the irritating qualities of such alloys may be due, in an occasional case, to sensitivity to one or more of the metallic constituents.

#### SUMMARY

A case of contact stomatitis due to nickel sensitivity in a metal (nickel, cobalt), sensitive patient is described. The significance of metal sensitivity in dentistry and orthopedic surgery is discussed.

357 Thirtieth Street  
426 Seventeenth Street

#### REFERENCE

1. Rattner, Herbert: "Stomatitis due to Sensitization to Dental Plates," *Journal American Medical Association*, 106:2230, 1936.

Germes were first seen by man in 1676 when Anthony Leeuwenhoek made a one-lens microscope.

Loss of only 20 per cent of the body's water content causes death.

## TOXEMIAS OF LATE PREGNANCY: OUTLINES OF THERAPY\*

ERNEST W. PAGE, M. D.

*Berkeley*

THE presentation of a system of therapy for the hypertensive disorders of pregnancy in tabular and outline form has an advantage in its simplicity and readiness for use. The summary below has been prepared primarily for the physician who is only occasionally confronted with such toxemias, and who has not the time for studying the innumerable articles on the subject. Much of the current literature bearing on the treatment of toxemias is concerned with specific aspects of treatment, often based upon some favored theory as to etiology; or it discusses the treatment of eclampsia in such general terms, with so many alternate methods of therapy, that practical directions are difficult to obtain. An outline such as this, on the other hand, is quite inadequate for the specialist who is interested primarily in the academic arguments relating to therapy. Many of the reasons for accepting or rejecting a procedure or a drug, and the references pertaining thereto, are sacrifices to brevity.

Until the exact etiology of the hypertensive syndromes is known, the treatment must remain symptomatic. We have learned much about the pathologic physiology of eclampsia, and this information is our only basis for any rational therapy. The methods outlined below have been modified gradually over a period of years, and are derived from many sources. They are quite identical with those now in use at both the Alameda County Hospital and the Los Angeles County Hospital.

#### CLASSIFICATION AND INCIDENCE

Hypertension, as a symptom, appears in three to ten per cent of pregnancies, the actual incidence depending upon the type of sample selected for study. The classification of that hypertension is important to the patient only insofar as it determines the prognosis and treatment. Several classifications have been devised, and four of these are presented in Table 1.

It will be noted that, in all classifications, there are two major divisions: the "pure" or specific toxemia peculiar to pregnancy and the various preëxistent vascular or renal diseases complicated by pregnancy. Occasionally there are mixed types, the former being superimposed upon the latter; but this should not deter us from attempting an exact diagnosis. The frequency distribution of the different groups is also shown in the table, and in the last column these percentages have been determined for both a hospital and a private series. The hospital cases show a much higher incidence of hypertensive complications simply

\* Read before Section on Obstetrics and Gynecology, at the Seventy-first Annual Session of the California Medical Association, Del Monte, May 3-6, 1942.